## History of U.S. Underride Research & Recommendations

**1896 This patent for a side underride protective device for street cars was issued on July 14 1896 and cited by numerous more recent underride patents: http://www.google.com.pg/patents/US564027.**
**1913** A patent was issued in 1913 for a "Safety Device for Motor Vehicles" to provide underride protection for the sides of large trucks. https://www.google.com/patents/US1127241 Since that time, numerous patents have been published which refer to this 1913 patent (with the patent information organized in these columns: Citing Patent, Filing date, Publication date, Applicant, Title):

- US4688824 * Mar 4, 1986 Aug 25, 1987 Herring John D Safety device for vehicles
- CN100572144C May 27, 2005 Dec 23, 2009 沃尔沃拉斯特瓦格纳公司 Device for a vehicle side anticollision box, and a vehicle comprising such a side anticollision box
- US7407204 * Nov 27, 2006 Aug 5, 2008 Volvo Lastvagnar Ab Arrangement for a vehicle side fairing, and a vehicle comprising such a side fairing
- US20070085355 * Nov 27, 2006 Apr 19, 2007 Volvo Lastvagnar Ab Arrangement for a vehicle side fairing, and a vehicle comprising such a side fairing
- US7780224 Jun 9, 2008 Aug 24, 2010 Vanguard National Trailer Corporation Crash attenuating underride guard
- US20080303311 * Jun 9, 2008 Dec 11, 2008 Vanguard National Trailer Corporation Crash attenuating underride guard
- US7887120 Jan 26, 2009 Feb 15, 2011 Transtex Composite Inc. Aerodynamic trailer skirts
- US7942467 Dec 24, 2009 May 17, 2011 Transtex Composite Inc. Aerodynamic skirt support member
- US7942468 Dec 24, 2009 May 17, 2011 Transtex Composite Inc. Aerodynamic skirt securing mechanism
- US7942469 Dec 24, 2009 May 17, 2011 Transtex Composite Inc. Aerodynamic skirt panel
- US7942470 Dec 24, 2009 May 17, 2011 Transtex Aerodynamic skirt

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| | | Composite Inc. | | opening |
| • US7942471 | Dec 24, 2009 | May 17, 2011 | Trnastex Composite Inc. | Aerodynamic skirt shape |
| • US20090189414 * | Jan 26, 2009 | Jul 30, 2009 | Mathieu Boivin | Aerodynamic trailer skirts |
| • US20100096880 * | Dec 24, 2009 | Apr 22, 2010 | Mathieu Boivin | Aerodynamic skirt panel |
| • US20100096882 * | Dec 24, 2009 | Apr 22, 2010 | Mathieu Boivin | Aerodynamic skirt opening |
| • US20100096883 * | Dec 24, 2009 | Apr 22, 2010 | Mathieu Boivin | Aerodynamic skirt shape |
| • US20100187856 * | Dec 24, 2009 | Jul 29, 2010 | Mathieu Boivin | Aerodynamic skirt support member |
| • US20100187856 * | Dec 24, 2009 | Jul 29, 2010 | Mathieu Boivin | Aerodynamic skirt support member |
| • US20100264691 * | Apr 15, 2010 | Oct 21, 2010 | Giromini Richard J | Side underride cable system for a trailer |
| • US8292351 | Apr 3, 2011 | Oct 23, 2012 | Transtex Composite Inc. | Resilient strut for aerodynamic skirt |
| • US9004575 | Aug 3, 2011 | Apr 14, 2015 | Gary Alan Grandominico | Aerodynamic skirt assembly |
| • US20110175396 * | Apr 3, 2011 | Jul 21, 2011 | Mathieu Boivin | Aerodynamic skirt |
| • US8398150 | Apr 17, 2012 | Mar 19, 2013 | Wabash National, L.P. | Side skirt system for a trailer |
| • US8449017 | Sep 11, 2012 | May 28, 2013 | Transtex Composites Inc. | Aerodynamic skirt resilient member |
| • US20120169086 * | Mar 7, 2012 | Jul 5, 2012 | Giromini Richard J | Side underride cable system for a trailer |
| • US8579359 | Jan 15, 2013 | Nov 12, 2013 | Wabash National, L.P. | Side skirt system for a trailer |
| • US8678474 * | May 17, 2013 | Mar 25, 2014 | Transtex Composite Inc. | Self-repositioning aerodynamic skirt |

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| US8783758 | Mar 19, 2013 | Jul 22, 2014 | Wabash National, L.P. | Folding side skirt system for a trailer |
| US8801078 | Oct 9, 2013 | Aug 12, 2014 | Wabash National, L.P. | Side skirt system for a trailer |
| US9199676 | Jul 2, 2014 | Dec 1, 2015 | Wabash National, L. P. | Side skirt system for a trailer |
| US9409610 | Mar 11, 2015 | Aug 9, 2016 | Wabash National, L.P. | Side skirt system for a trailer |
| US9573636 | Mar 12, 2015 | Feb 21, 2017 | Ridge Corporation | Aerodynamic skirt assembly |
| US9688320 | Oct 27, 2015 | Jun 27, 2017 | Wabash National, L.P. | Side skirt system for a trailer |

**1969 DOT published a document for rear underride proposed rulemaking on the Federal Register on March 19, 1969, indicating that they "anticipated that the proposed Standard will be amended, after technical studies have been completed, to extend the requirement for underride protection to the sides of large vehicles."** http://annaleahmary.com/2016/03/side-guards-the-original-intent-of-nhtsa-rulemakers-in-the-1969-nprm-docket-no-1-11-notice-2/

**1977** Page Patent guard rail for side protection on large wheel vehicles, 1977 US Side Guard Patent US4060268 William Page.pdf
**1977** An Insurance Institute for Highway Safety (IIHS) crash test research illustrates the ineffectiveness of 1953 rear underride guard.http://www.iihs.org/externaldata/srdata/docs/sr1206.pdf#page=5
**1977** A Senate hearing leads to new calls for stronger underride protections, and illustrates the inadequacies of existing requirements.http://www.iihs.org/externaldata/srdata/docs/sr1206.pdf
**1996** Volvo began manufacturing trucks with Front Underrun Protection in 1996 in Europe. This is a patent filed in 2007 for an "Underrun protector and method of providing underrun protection." http://www.google.sr/patents/WO2008002242A1?cl=en Other relevant information on front underrun protection can be found here: http://annaleahmary.com/tag/front-underrun-protection/
**1997** Study illustrates the discrepancies in The Fatal Accident Reporting System (FARS) underride fatality count when compared to the NHTSA database, highlighting that more people are dying from underride than are being recorded. http://www.iihs.org/externaldata/srdata/docs/sr3202.pdf
**2009** IIHS begins to call for the requirement of front and side underride guards, as well as improved rear guard requirements in its testimony to US House Committee on Energy and Commerce.
file:///C:/Users/LD46500/Downloads/testimony_2009-05-18.pdf
**2009** Patent filed for a "Side impact guard device for industrial vehicles, particularly trailers or semi-trailers"

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| US7967349 | Apr 7, 2009 | Jun 28, 2011 | C.R.F. Societa Consortile Per Azioni | Side impact guard device for industrial vehicles, particularly trailers or semi-trailers |

**2010** An evaluation of U.S. rear underride guards meeting federal requirements shows that these protections still allow for severe passenger vehicle underride, often resulting in serious or fatal injury. https://www.ncbi.nlm.nih.gov/pubmed/21512906 file:///C:/Users/LD46500/Downloads/22esv-000074.pdf
**2011** IIHS crash test study demonstrates that federal underride safety standards can fail in relatively low-speed crashes.http://www.iihs.org/iihs/sr/statusreport/article/46/2/1
**2012** Sapa Extrusions (inventor/engineer Malcolm Deighton) filed for a patent in 2012 for a "Semi trailer under-run protection device" which they later developed into a rear underride guard which was successfully crash tested on a trailer in April 2017. https://www.google.com/patents/USD703106
**2013** New crash test study shows how underride guards on most heavy trucks fail to prevent underride and result in serious injury or fatality.http://www.iihs.org/iihs/news/desktopnews/new-crash-tests-underride-guards-on-most-big-rigs-leave-passenger-vehicle-occupants-at-risk-in-certain-crashes
**2015** NTSB recommends that regulators develop performance standards for side and front underride protection systems to improve highway vehicle crash compatibility with passenger vehicles. https://www.ntsb.gov/safety/mwl/Pages/mwl9_2015.aspx
**2015** Aaron Kiefer, crash reconstructionist and forensic engineer, was issued a patent for an innovative combination side & rear trailer underride protection system: https://www.google.com/patents/US9463759 Please see the numerous underride patents referred to in this patent.
**2015** This patent for a Trailer rear impact guard cites numerous other underride protection patents: https://www.google.com/patents/USD790407
**2016 NHTSA** issued a grant to Texas A & M Transportation Institute for computer modeling research on side underride protection. http://www.wusa9.com/news/investigations/truck-trailer-rear-guard-rules-have-huge-holes-safety-experts-

say/457353893
**2017** IIHS tests side underride guards at 35 mph, and illustrates the dramatic impact side guards have in preventing serious injury and death. http://www.iihs.org/iihs/news/desktopnews/iihs-tests-show-benefits-of-side-underride-guards-for-semitrailers
**2017** Seven Hills Engineering, Perry Ponder inventor of Angel Wing Underride Protection successfully crash tested at 35 MPH by IIHS on 3/30/2017 and 40 MPH on 8/29/2017. Patent Pending http://www.7he.us and http://airflowdeflector.com/airflow-2/
**2017** Advocates for Highway and Auto Safety urges DOT to put forth a federal mandate on side underride guards. http://saferoads.org/2017/05/10/advocates-statement-on-need-for-strong-truck-side-underride-guards/
**2017** NBC Today Show Link/Story https://www.nbcnews.com/news/us-news/side-underride-crashes-kill-200-people-year-will-congress-act-n711721
2017 DOE has issued grants for a Super Truck project which has included side skirts for fuel efficiency but not for safety. http://annaleahmary.com/2017/02/perfect-opportunity-to-transform-supertruck-into-an-esv-to-advance-underride-protection-dot-doe/